

# Commercialising Community Forestry in Indonesia: Lessons About the Barriers and Opportunities in Central Java

Setiasih Irawanti · Kirsfianti L. Ginoga ·  
Aneka Prawestisuka · Digby Race

Accepted: 5 May 2014 / Published online: 17 May 2014  
© Steve Harrison, John Herbohn 2014

**Abstract** The integration of agriculture and forestry is commonly viewed as a foundation for sustainable livelihoods for small-scale farmers. In many tropical countries, traditional farming practices by smallholders include some trees or forest management for multiple purposes. This article reports on research that explores the experiences of smallholders in Central Java, Indonesia, who are increasingly blending aspects of their traditional farming practices with cultivation of commercial timber trees. Smallholders manage complex farming systems that are responding to the demands of commercial markets. Smallholders in Central Java typically manage a wide range of species that yield short-, medium- and long-term products that are used by households and sold into commercial markets. However, the authors' research indicates that smallholders may not be optimising their forest management in relation to the potential financial returns, leading to a lower expectation of the value of forestry to their livelihoods. Support for community forestry could address several knowledge gaps amongst smallholders, so that community-based commercial forestry achieves its potential.

**Keywords** Forestry support programs · Central Java · Albizia · Thematic hierarchy analysis

## Introduction

While rural communities have historically had a strong dependence on forests in most parts of the world (Sands 2005; Charnley and Poe 2007), it was in the 1970s

---

S. Irawanti · K. L. Ginoga · A. Prawestisuka  
Forestry Research and Development Agency, Ministry of Forestry, Bogor, Indonesia

D. Race (✉)  
The Fenner School, The Australian National University, Canberra, Australia  
e-mail: digby.race@anu.edu.au

that community forestry was articulated as a strategy to address the detrimental impacts of deforestation on the livelihoods of rural communities in some developing countries in Asia (e.g. India, Nepal and the Philippines) (Gilmour and Fisher 1997; Hobley 1996; Malla 2000). The concept was soon popularised by international aid agencies and governments in many other countries in Asia, Africa and Central and South America, and later expanded to include options for commercialisation of forest products as a means of addressing rural poverty (Alden Wiley 2002; Gilmour et al. 2004; Pagdee et al. 2006; Hobley 2007).

Although it is difficult to define accurately the global area of community forestry and the number of people now involved—for example, due to informal use of forests by some communities, incomplete databases of all recognised community forests, poor definition of forest boundaries and the communities involved, and differences in opinion as to the extent communities have ‘control’ over forests—the area of forests and the number of people involved is believed to be vast and increasing. While nearly 400 M ha of forest was estimated to be under community control or management in 2001 (including areas not necessarily formally recognised as community forestry), this area is expected to increase to about 740 M ha by the year 2015—directly involving about 300 million people (Bull and White 2002).

Despite the enormous global scale of community forestry, over time several experienced analysts have expressed doubt about the magnitude of the livelihood benefits that have been achieved (Cernea 1991; Fisher 2003; Gilmour et al. 2004; Hobley 2007). Lessons from Indonesia and other countries indicate that community participation in the commercial forestry sector alone is insufficient to guarantee ‘successful’ community-based forestry for participants, a major concern being that smallholders are drawn into commercial markets that they do not fully understand (Race et al. 2009).

In many tropical countries, including Indonesia, smallholders are the people at the interface of intense and often competing pressures of agriculture and forestry—striving to maintain their livelihoods that must increasingly bridge traditional farming practices and modern commercial markets (FAO 2012). When smallholders are surrounded by natural forests, there can be persistent pressure to convert the land use to food-oriented agriculture to meet the needs of the local population and commercial markets further afield (Hairiah et al. 2003). Yet despite the priority given to agriculture by most rural communities, forests on some scale are usually viewed as a desirable and complementary land use throughout much of Indonesia. In this article, the authors report on recent research grounded in the experiences of smallholders in Central Java to explore the integrated management of community forestry, and the challenges smallholders face when seeking to enter into new commercial timber markets.

## Community Forestry in Central Java

Even on the island of Java, which supports 145 million people (60 % of Indonesia’s population) and is one of the world’s most densely populated islands (with more than 1,000 people/km<sup>2</sup>), many farm families are actively pursuing forms of agroforestry and community forestry in their surrounding farmland (Wiersum

1988). Yet the pressures to retain existing forest areas continue, with less than 14 % of the area of Java covered by forests (about 18,000 km<sup>2</sup>) (FWI and GFW 2002).

There are several Indonesian government programs that have supported, and continue to support, the development of community forests, including the People's Nursery Garden (KBR, operating during 2010–11), the Community Direct Assistance for Development of Rural Community-Based Forestry Conservation (BLM-PPMBK), and the Village Nursery (KBD). The features of these programs include:

- the KBR program provide seeds for timber and multi-purpose species, which are grown by local community groups. Seedlings grown under the KBR program were usually woody trees (e.g. *albizia*) and estate crops grown exclusively for commercial markets (e.g. rubber) and fruit trees, and were used by smallholders to rehabilitate degraded forest areas or to establish new forests;
- the BLM-PPMBK program has a strong agrarian focus, with 85 % of the funds used for establishing woody species on farm and forestlands and 15 % for development of other agricultural enterprises, including purchase of livestock, material for crops or animal fodder; and
- the KBD program, which began in 2009 and is delivered through the District government, provides funds for the purchase of seeds of woody species for planting in rural areas. Seeds are distributed to farmer groups to grow seedlings for planting on roadsides, and in fields and house yards, school grounds and office compounds.

The province of Central Java is home to an estimated 32 million people and has a forest cover over about 30 % of the land area (1.06 M ha). Of this area, about 40 % is comprised of various types of community forestry (Forestry Provincial Office of Central Java 2011), which typically fulfil an array of important roles for farm families, including provision of:

- fuelwood, food plants and medicinal herbs for household use;
- fodder for livestock;
- timber for constructing houses and livestock stalls; and
- timber and other forest products sold commercially.

A popular tree species in Central Java is the fast growing *albizia* (*Paraserianthes falcataria*), which makes an important contribution to household, regional and national economies (Kininmonth 1986). In fertile sites, *albizia* can produce commercial timber in just 4–5 years. While there is strong support for the development of community-based forests by various government and non-government programs, and widespread appeal for small-scale integrated forestry amongst smallholders in Central Java (Awang et al. 2002), the commercial success of community forestry is not always apparent.

## Research Method

This article discusses recent socio-economic research conducted in the district of Pati in Central Java. To understand the varied and intricate contribution of *albizia* to

households and the wider economy, the experiences of people growing, harvesting and trading timber of this species were investigated in three villages where community forestry has been an established practice for several decades: Giling, Gunungsari and Payak. Both quantitative (e.g. areas of farm and forest, yields and prices of farm and forest products) and qualitative (e.g. understanding of market dynamics, satisfaction with prices received) data were collected via semi-structured interviews during 2012–13. All interviews were framed by a common interview guide and survey, which was developed and tested by the authors and other members of the research team. Interviewees were selected using a stratified random sampling approach applied to households in three villages (45 individual interviews, with 15 interviews per village), with an additional six focus group discussions (65 people participated in FGDs, with one FGD held amongst male farmers and another amongst female farmers in each of the three villages), and analysis of secondary data (including forest statistics recorded by the District government).

Interviews and focus group discussions were facilitated according to contemporary social science methods (described by Bryman 2008), with interviews and group discussions designed to explore farmers' experiences of community forestry and the household and commercial value they attached to albizia trees. The primary method of data analysis was thematic hierarchy analysis, where emergent topics of conversation are identified and aggregated into subordinate and dominant themes, an analytical approach described by King and Horrocks (2010).

## Research Results

### The Study Area in Central Java

While every farm is unique in terms of its area and enterprise composition, it is common for smallholders to have farms comprised of three landuses: yard land (the area immediately around houses), wet land (the irrigated area, mainly for rice production), and dryland (rainfed area for cropping and grazing)—a mixed farming system that has been common for more than a century (Penny and Ginting 1984). Agronomic data obtained from respondents indicates the average composition of farmland in Central Java is dominated by dryland (76.1 %), with smaller areas of yard land (12.5 %) and irrigation land (11.4 %). Typically, community forests are planted on the yard land and dryland (the combined area of 'yard' and 'farm' land covers about 88 % of farmland in Central Java), so that the produce for households and financial returns from community forests has the potential to be a major source of food, fibre and income for many farm families. Of overall household income, community forestry comprises an average of 25–32 % (US\$590–1,200/year), with the income of individual households being within the range of US\$2,400–4,100 per year across the three villages.

Interviewees reported that when commercial markets for albizia timber are lucrative, high timber prices can trigger the conversion by farmers of irrigation land into dryland, especially when irrigation water is not available all year for rice

production. Also, some farmers reported they have replaced the traditional crop of cassava with albizia, because the establishment cost of albizia is less and the management is less labour-intensive than cassava. Nevertheless, it is common for farmers to have at least a partially blended use of land, with seedlings of albizia planted and managed together with cassava seedlings, until the cassava is harvested at the end of the first year. From the second year, the albizia is grown on until it is harvested at 4 or 5 years of age. Sometimes the albizia is under-planted with other crops or fodder grass.

As elsewhere throughout Java, the yard land of smallholders resembles an artificial forest, a dense irregular planting of mixed species that serve multiple functions: household food, animal husbandry, shade and shelter, produce to be sold at markets, and landscape beautification. Given the proximity of such forests, they often yield non-timber forest products (NTFPs, such as grasses and small branches for livestock) that are used on a regular basis by the farm family. This research indicates the considerable value of NTFPs for farm families, highlighted by the data that NTFPs contribute an average of 64 % and timber contributes 36 % of the total revenue from farm-based forests. Of the timber revenue, 92 % is derived from the sale of albizia.

Despite the important role of community forestry to the household economy for farm families, there appear to be some serious deficiencies in smallholders' management. Survey respondents explained their approaches to establishing, managing and harvesting NTFPs and timber from their forests, which revealed a range of potential shortcomings to achieving the optimal value. Several illustrative quotes from the interviews with smallholders (subsequently translated into English) include:

... I usually plant seedlings of albizia from what I can gather from the natural regeneration that grows on my land. Sometimes I buy seeds from the local market or the District Forestry Office. I don't know how to determine the quality of the seeds ...

... we control any pests we find by physical means, like removing the galls from plants and then burying them in the ground so they can't spread. Sometimes we spray the trees with sulfur. There are also farmers who add lime to water and then spray that on albizia trees with rust galls ...

... most of the farmers in this village raise goats (*interview data indicated about 80 % of farmers have goats*), even those that don't have any farmland (*interview data indicates 30 % don't have farmland*). Goats are a good source of family income, because they reproduce quickly, are easy to maintain and sell, and live off a wide range of fodder that grows around here, such as grass, cassava leaves, cottonwood leaves, albizia leaves and the leaves of other timber species. Pruning of albizia foliage (*leaves and branches*) is mainly done to provide a fodder crop ....

... most farmers aren't interested to be involved in harvesting the timber from their our forests; it is generally considered to be troublesome work. So we usually sell our timber trees only when we need cash, it is easier this way ... then we don't have to have to worry about measuring, calculating the volume and harvesting ....

Several factors that appear to limit the household and commercial value of forestry for smallholders in Central Java were identified, including that:

- most farmers do not know how to recognise superior plant seeds or seedlings (most seed is obtained from local markets or the District Forest Office);
- pests (e.g. caterpillars, mealybugs) and diseases (e.g. rust gall) are rarely controlled effectively, leading to slower tree growth and deaths, with pest outbreaks spreading to neighbouring trees and forests;
- silviculture is usually geared towards secondary products (e.g. fuelwood for household use, fodder for livestock), rather than the more valuable timber market; and
- most farmers have a poor understanding of how their silviculture relates to timber quality and the product specifications in commercial markets.

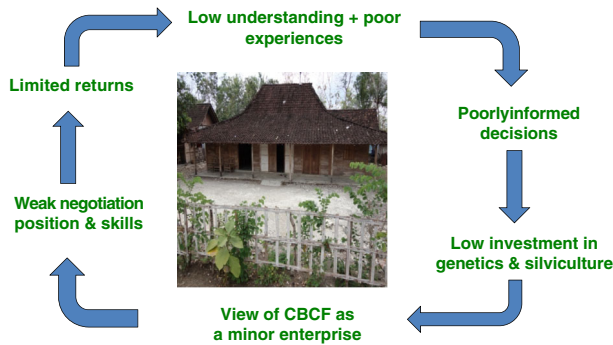
In combination, these limiting factors provide a self-fulfilling feedback loop to smallholders that forestry is a less valuable enterprise than it could be. This in turn leads most smallholders into a cycle of under-investment in forestry (Fig. 1 illustrates the conceptual model of under-investment in commercial forestry by smallholders, below). That is, low financial returns from community forestry reinforces the smallholders' view that the commercial side of forestry does not warrant increased investment—of their time, land or finance. In turn, their limited investment leads smallholders into using poor genetic material and poor silvicultural practices and having a weak grasp of the dynamics of commercial markets. Addressing any of the above limitations in isolation may be insufficient to break the cycle of under-investment and change the perceptions of community-based commercial forestry (CBCF) held by smallholders, so an integrated approach to assisting smallholders to optimise their investment in forestry is needed.

### Limitations of Forestry Extension Services in Indonesia

Indonesia has an established institutional structure to provide technical forestry advice and support to smallholders, with forestry extension staff instructed to hold monthly meetings with local groups of farmers to listen to their issues and explore solutions. Each sub-district has about 1–3 forestry extension staff, with each person working with about 5–13 villages. They often undertake extensive travel to remote areas, usually travelling by motorcycle. While the structure for forestry extension appears appropriate, the staff have limited capacity to achieve a high level of performance. Many staff interviewed reported that they had a shortage of current extension material (e.g. information sheets on silviculture) for sharing with smallholders, and that their own knowledge is limited by their lack of experience and training opportunities. Extension staff also face tight funding constraints on their activities.

### High Demand for Albizia Timber

Albizia timber is an important forest species for smallholders in Central Java because it can contribute to household needs and has strong market appeal (Sutigno



**Fig. 1** Cycle of under-investment in commercial forestry by smallholders

1987). Moreover, it can assist to overcome periods of financial stress by being harvested at 4–5 years from planting, much less than many other timber species (e.g. teak and mahogany). Usually farmers sell albizia timber standing (before being harvested), with all of the harvesting costs covered by the buyer or the village trader. In turn, the village trader sells the albizia timber to the processing company which makes value-added products, such as veneer panels and jointed (parquetry) panels.

Smallholders usually sell their timber on either a per tree basis or by area of land. When timber is sold according to the land area, the timber volume and quality (grade) are estimated by the village trader and a price offered (as listed in Table 1). Growers are usually paid at the time an agreement is made with the trader.

In Central Java, the popularity of albizia as a commercial timber has seen the processing industry expand rapidly over the past 20 years, with 374 small sawmills in operation with a capacity of less than 2,000 m<sup>3</sup>/year, 173 sawmills with a capacity of 2,000–6,000 m<sup>3</sup>/year, and a further 44 sawmills with greater capacity that also produce veneer and plywood (Forestry Provincial Office of Central Java 2011). To ensure continuity of supply for each sawmill, it is common for each district to have a timber depot supplied by hundreds of traders. To ensure the most appropriate grade and volume of timber is delivered to a sawmill, an extensive network of people are employed to coordinate the timber supplies for individual sawmills (e.g. harvesters, loaders, truck drivers, log graders). Graders can appraise timber at any stage along the value-chain, such as when trees are still standing and owned by farmers, when the timber is owned by the village trader, or when it is being stored at the village depot. The high level of market competition for albizia timber in Central Java has encouraged the development of community forests, although as noted above smallholders generally have a poor understanding of how timber volume and grades translate into prices.

It is common in Indonesia for the commercial value of timber to be determined by diameter and grade. Albizia logs are usually traded in lengths of 260, 130 or 100 cm (see Table which lists price and log specifications for albizia in Central Java, below). There are primarily two grades of timber, ‘super’ logs and ‘reject’ logs. The premium grade ‘super’ logs (illustrated in Fig. 2) can be processed by

**Table 1** Timber prices in Central Java, 2012

Log grade	Log price (Rupiah/m <sup>3</sup> )		
	Logs prices paid at the farmer gate <sup>a</sup> (i.e. on the truck or side of road)	Log prices paid at the factory gate	
		Used for plywood <sup>b</sup>	Used for jointed board <sup>c</sup>
‘Super’ logs			
Length of 100/130 cm			
Diameter 20–24 cm	599,000	720,000	
Diameter >25	754,000	875,000	
Length of 260 cm			
Diameter 28–29 cm	795,000	916,000	
Diameter 30–39 cm	979,000	1,100,000	
Diameter 40–49 cm	1,019,000	1,140,000	
Diameter >50 cm	1,029,000	1,150,000	
A. ‘Reject’ logs			
Length of 130 cm			
Diamater 10–14 cm	329,000		470,000
Diameter 15–19 cm	429,000		570,000
Diameter >20 cm	449,000		590,000

Source: Trees4Trees (2012)

10,000 Indonesian Rupiah (IDR) = US\$0.82, as at January 2014

<sup>a</sup> Pati District, <sup>b</sup> Batang District, <sup>c</sup> Temanggung District

plywood mills, while the lower grade ‘reject’ logs are processed by sawmills into small board dimensions (referred to as *balken*) which is then processed into barecore, jointed board or laminated board.

Some key points to note from Table 1 are that the price (IDR/m<sup>3</sup>) is the same whether the log length is 100 cm or 130 cm, so there may be scope for growers to improve their financial returns simply by maximising the number of logs cut to 100 cm length, rather than 130 cm length. Also, the price offered for ‘reject’ and ‘super’ logs were significantly different, and so extending the period of growth for albizia trees in Central Java by 1–2 years can lead to logs being upgraded to the ‘super’ grade with a higher timber price.

For many smallholders, the commercialization process for forest products remains much of a mystery, so growers tend not to invest their time on silviculture that enhances tree growth and timber quality. Many smallholders are still persuaded to sell the timber from their albizia trees as soon as possible, with recent estimates indicating that 70 % of the albizia timber sold is as ‘reject’ logs (Trees4Trees 2012).

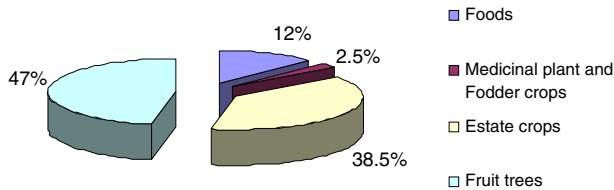
### Generation of Income from NTFPs

Community forestry in Central Java has a strong emphasis on a range of agroforestry products, which commonly includes food crops (e.g. cassava, corn,





**Fig. 2** ‘Super’ logs of albizia ready for transportation to processors in Central Java, 2012 (Photo by Novi and Nunung)



**Fig. 3** Average proportional value of NTFP groups sold per household in the study villages in Central Java

sweet potatoes), medicinal plants (e.g. cardamom, ginger), forage grass crops, estate crops (e.g. cocoa, coffee, cloves, coconut, kapok, pepper, vanilla), and a range of fruit trees (e.g. jengkol, mangosteen, petai, bananas, toothless gum, durian, rambutan). The contemporary market practice is for traders to visit individual farm families to purchase NTFPs, which are sold in standardised units (“Appendix” lists estimated prices paid to farmers for NTFPs, below). The harvest frequency of the various types of NTFPs ranges between monthly to yearly, with produce sold by production unit, e.g. kg, quintal (100 kg) or tree, or per area of land. Also, some types of NTFPs are sold in a dried form and others are sold green soon after harvest. The value of NTFPs sold per household were US\$285 (Payak), US\$525 (Giling) and US\$800 (Gunungsari). The composition of the NTFPs also varied considerably between the three villages, with fruit crops representing 75 % of the total value of NTFPs in Payak yet estate crops represented most of the commercial value (55 %) in Gunungsari and about 38 % in Payak. However, when the data are aggregated across the three villages, fruit trees are the most valuable group of NTFPs (Fig. 3 provides an indicative value of groups of NTFPs to household income, below).

An additional value of albizia is that it’s relatively light and open canopy allows a range of crops to be grown in the various vertical layers of the agroforestry. There is a strong prevailing culture amongst smallholders in Central Java of growing highly

diverse forests (sometimes referred to as a mixed garden forest, known as *wono*), to which albizia is well suited. Smallholders reported that by maintaining a high density of foliage—either amongst ground-level crops or the tree canopy—they can reduce the severity of soil erosion after heavy rainfall, lower the air temperature, and inhibit the growth of weeds.

The commercial value of NTFPs does not always represent the full value of each crop or product for the farm family, particularly in that many NTFPs are used within the household to support daily livelihoods. For example, corn is harvested, dried and stored, to be consumed by the farm family or sold for cash. Other crops, including cassava, are harvested and sold directly by the farmers to the processing factory, or sold to local traders who assemble a bulk load before selling to the factory.

Most fruit crops (including durian, jengkol, mango, rambutan and bananas) are harvested by farmers and sold as fresh fruit to local markets or traders. As a general observation, smallholders engaged in community forestry and agroforestry activities in Central Java exhibit a high level of competency in relation to the cultivation, harvesting and post-harvest handling of a wide range of NTFPs. Smallholders were also found to practice complex farming systems, where they manage the integration and succession of many species so that food crops, medicinal plants and fodder for livestock could be harvested on a weekly basis (short-term), fruit and estate crops could be harvested on an annual basis (medium-term), and timber trees could be harvested on a 5-yearly basis (long-term). By successfully managing the complexity of the farming system, smallholders are able to independently sustain much of their livelihoods and receive financial returns from commercial sales.

## Conclusions

Smallholders in Central Java continue to manage complex farming systems that appear to be an astute blend of traditional knowledge and practices and responses to emerging commercial markets. The cultivation of albizia for timber which can be readily sold in commercial markets in Central Java is a relatively recent addition to the traditional community forests in Central Java. However, this research also indicates that most smallholders are yet to acquire the knowledge and skills to optimize the financial returns from growing albizia trees. There appears considerable scope to build the capacity of Indonesia's existing network of forestry extension staff to support farmers so that:

- genetically improved seeds and seedlings can be readily identified and purchased;
- early recognition of the presence of pests and diseases occurs, and effective treatments are applied;
- the range of silvicultural options is known, and how the different options influence the growth rates and quality (grades) of timber produced; and
- there is greater understanding of how various silvicultural options relate to the product specifications in commercial markets.

**Acknowledgments** The authors express their warm appreciation to the smallholders and district forestry staff of Central Java who kindly gave their time to discuss their experiences about community forestry. Also, the authors thank their many colleagues working on the research project '*Overcoming Constraints to Community-Based Commercial Forestry in Indonesia*', to which the information reported in this article contributes. The research project received financial support from the Australian Centre for International Agricultural Research during 2011–2014. The authors thank Steve Harrison and two anonymous reviewers for their constructive comments on an earlier draft of this article.

## Appendix

See Table 2.

**Table 2** Prices of NTFPs from community forests in Central Java, 2012

Group type	Type of NTFPs	Annual frequency	Price	
			Unit	Price per unit (Rp)
Food crops	Cassava	1	Kg green	1,000–1,500
	Sweet potato	1	Quintal	1,500,000
	Corn	1–2	Kg dried	2,500
Medicinal species	Cardamom	1–3	Kg dried	33,000–40,000
	Ginger	1	Quintal green	20,000
Fodder crops	Fodder stock	6	Bundle	5,000
Estate crops	Cocoa	3–12	Kg dried	11,000–17,000
	Coffe	1–2	Kg dried	20,000
	Coconut	8–10	Unit	1,000–1,500
	Clove	1	Kg dried	50,000–125,0000
	Kapok	1	Kg dried	3,000–4,200
	Pepper	1	Kg dried	60,000
Fruit	Jengkol	1–2	Kg green	4,000–11,000
	Mangosteen	1–7	Kg	5,000–6,000
	Pete	1	Bulk	90,000–2,200,000
	Bananas	1–24	Stem	13,000–40,000
	Durian	1	Bulk	350,000–1,500,000
	Rambutan	1	Bulk	50,000–400,000
	Toothless gum	4	Kg	2,500

## References

- Alden Wiley L (2002) From meeting needs to honouring rights: the evolution of community forestry. Invited paper submitted to the XII World Forestry Congress, Quebec
- Awang SA, Wahyu A, Barriatul H, Wahyu TW, Agus A (2002) Community forestry: social economic and marketing. Publisher Agency of Economic Faculty of Gadjah Mada University, Yogyakarta
- Bryman A (2008) Social research methods. Oxford University Press, Oxford
- Bull G, White A (2002) Global forests in transition: challenges and opportunities. In: Proceedings of global perspective on indigenous forestry: linking communities, commerce and conservation, 4–6 June 2002, Vancouver

- Cerneza MM (1991) The social actors of participatory afforestation strategies. In: Cerneza MM (ed) Putting People First: Sociological variables in rural development, 2nd edn. Oxford University Press, Oxford, pp 340–393
- Charnley S, Poe MR (2007) Community forestry in theory and practice: where are we now? *Annu Rev Anthropol* 36(October):301–336
- Fisher RJ (2003) Innovations, persistence and change: reflections on the state of community forestry. In: RECOFTC, FAO (eds) Community forestry: current innovations and experiences. Regional Community Forestry Training Centre (RECOFTC), Bangkok
- Food and Agriculture Organisation (FAO) (2012) State of the World's Forests: 2012. Food and Agriculture Organisation of the United Nations, Rome
- Forest Watch Indonesia (FWI) and Global Forest Watch (GFW) (2002) The state of the forest: Indonesia. Forest Watch Indonesia, Bogor, Indonesia
- Forestry Provincial Office of Central Java (2011) Secondary data from sub department of forest exploitation. Semarang, Indonesia
- Gilmour DA, Fisher RJ (1997) Evolution in community forestry: Contesting forest resources. In: Victor M (ed) Community forestry at the cross road: reflection and future directions in the development of community forests. Regional Community Forestry Training Centre (RECOFTC), RECOFTC Report No. 16, Bangkok
- Gilmour D, Malla Y, Nurse M (2004) Linkages between community forestry and poverty. Regional Community Forestry Training Centre, Bangkok
- Hairiah K, Mustofa AS, Sambas S (2003) Introduction of agroforestry. Agroforestry teaching materials. Word Agroforestry Centre (ICRAF). Bogor, Indonesia
- Hobley M (1996) Participatory forestry: the process of change in India and Nepal. Overseas Development Institute, London
- Hobley M (2007) Forests—the poor man's overcoat: foresters as agents of change? Paper presented at the Australian National University, 3rd April, Canberra
- King N, Horrocks C (2010) Interviews in qualitative research. Sage, London
- Kininmonth JA (1986) Wood from fast-grown, short-rotation trees. In: Proceedings of the 18th IUFRO word congress. Division 5: forest products, Ljubljana
- Malla Y (2000) Impact of community forestry policy on rural livelihoods and food security in Nepal. *Unasylva* 51(202):37–45
- Pagdee A, Kim Y, Daugherty PJ (2006) What makes community forest management successful: a meta-study from community forests throughout the world. *Soc and Nat Resour* 19(1):33–52
- Penny DH, Ginting M (1984) Yard, farmers and poverty: a study of the nature and essence of Sriharjo rural farming community in Java. Gadjah Mada University Press, Agro Economics Foundation, Yogyakarta
- Race D, Bisjoe AR, Hakim R, Hayati N, Julmansyah, Kadir A, Kurniawan, Kusumedi P, Nawir AA, Nurhaedah, Perbatasari DU, Purwanti R, Rohadi D, Stewart H, Sumirat B, Suwarno A (2009) Partnerships for involving small-scale landholders in commercial forestry: lessons from Australia and Indonesia. *Int For Rev* 11(1):87–95
- Sands R (2005) Forestry in a global context. CABI Publishing, Wallingford
- Sutigno P (1987) *The nature and usefulness of Albizia falcataria timber*. Discussion proceedings of nature and usefulness timber type of timber estate. Forestry Research and Development Agency, Jakarta, Indonesia
- Wiersum KF (1988) Outline of the agroforestry concept. In: Viewpoints of agroforestry II. Department of Forestry Hinkeloord, Agricultural University of Wageningen, The Netherlands